

# **DESIGN-BUILD**

## **SUBMITTAL GUIDELINES**

### **FOR NORTH CAROLINA TURNPIKE AUTHORITY**

**July 6, 2008**

Revised November 23, 2009

The submittal process used in the Design-Build program is a critical link to the successful delivery of Design-Build projects. The submittal process is geared for rapid review, while ensuring that the project is safe, environmentally conscious, satisfies all national and state codes and manuals, and fulfills the requirements set forth in the Request for Proposals. This document outlines the procedures to be followed by both the Design-Build Team, NCTA staff, and the NCDOT Alternative Delivery Unit in the submittal, distribution, and review of plan submittals.

# **GENERAL**

## **Design and Personnel Expectations**

The Design-Build Team (DBT) is responsible for designing in accordance with the applicable national and state codes, standards, manuals, and current revisions and supplements thereto. Any design exceptions to these documents must be pre-approved by the appropriate reviewing personnel and the FHWA, if applicable, prior to incorporation into the plan submittal. In addition, if a plan submittal incorporates or assumes a design exception, then the DBT shall note this fact clearly on the submittal form that accompanies that submittal.

Prior to any submittals, the Design-Build Team shall provide the NCTA and the NCDOT Design-Build Project Engineer with a list of key design and construction staff. The NCTA and NCDOT will reciprocate by providing the DBT with a list of NCTA and NCDOT contacts to be used when submitting plans for review. The list of NCTA and NCDOT contacts shall only be used to accurately complete the submittal forms. All submittal correspondence, both verbal and written shall be directly among the DBT and the NCTA and/or NCDOT Design-Build Group, unless otherwise approved.

The comments, or lack thereof, provided by the NCTA and/or NCDOT in no way relieves the Design-Build Team of liability or the responsibility to correct any error in their plans, computations, or construction. The Design-Build Team will be required to make design and field construction corrections without additional compensation.

The NCDOT Alternative Delivery Unit is serving in a consultant capacity to the NCTA in the coordination, distribution, and review of submittals. Comments from any NCDOT staff as conveyed through the Alternative Delivery Unit shall be construed as comments from the NCTA. Any reference contained herein to the NCTA's review of submittals shall be construed as the review as completed by the NCTA and/or Alternative Delivery Unit.

## **Scheduling of Submittals**

If a Critical Path Model is required for the project, major design milestones and required design submittals shall be identified as activities on the approved CPM for the project. The Design-Build Team shall prioritize submittals in the event that multiple submittals are made based on the approved CPM. If the project contract does not require a CPM, the DBT shall submit an initial schedule of anticipated submittals,

denoting those submittals that are of critical importance to the project schedule. A new schedule shall be submitted if the critical submittals change or if the schedule or order of anticipated submittals is modified significantly.

## **Submittal Process**

Unless otherwise stated in the Final Contract scopes of work, all submittals shall be simultaneously delivered to the State Alternative Delivery Engineer, NCTA Director of Construction, and the NCTA Project Manager. As noted herein or in the Final Contract, other concurrent distributions may be required of the DBT. Submittals shall be made in the number of copies as noted herein or otherwise noted in the Final Contract. Pertinent submittals may also require design calculations, files, and special provisions. No construction work shall be performed prior to the NCTA's review, receipt of satisfactory response to the submittal comments, and the subsequent production of sealed Release for Construction Plans. With the exception of Erosion Control Plans, all Release for Construction Plans shall be clearly labeled as RFC and signed and sealed by a Professional Engineer registered in the State of North Carolina. The term RFC shall be solely reserved for those plans for which the NCTA agrees that no further review is necessary.

All submittals shall be accompanied with a standard color-coded submittal form. The Design-Build Team and the NCDOT Design-Build Project Engineer will decide on a color for each project prior to the first submittal.

The number of copies and the information transmitted shall be clearly noted on the submittal form. A submittal containing multiple copies of the same information shall be transmitted with the copies individually packaged and covered with the appropriate submittal form. For example, a submittal containing four sets of plans and cross-sections shall be submitted as four individual rolls each containing one set of plans and one set of cross-sections. Each roll shall have an identical color-coded submittal form.

Each submittal shall be assigned a submittal number. This submittal number shall not have suffixes other than those reflecting re-submittals of the same information. Specifically, "Revise and Resubmit" submittal responses require the Design-Build Team to correct and re-submit the same information with the original submittal number and an "R" suffix. For example, submittal S-001 shall be revised to S-001R1 to reflect the 1st re-submittal and S-001R2 to reflect the 2nd re-submittal of submittal S-001.

Submittals shall contain information for only one discipline. For example, if Structure Plans and Traffic Control Plans are submitted on the same day, two separate submittals are required. The Alternative Delivery Unit will then forward the submittals to the appropriate reviewing personnel.

If an individual is copied on a submittal, it shall be clearly noted whether that individual received the attachments or simply a copy of the submittal form.

For FHWA step-by-step projects, one additional set of plans and Project Special Provisions of all plans submittals shall be provided to the State Alternative Delivery Engineer. Unless otherwise noted herein, the staff of the Alternative Delivery Unit will make all distributions, including the set for the FHWA.

For projects that specific disciplines are not included in the Design-Build Team's or the NCTA's Scope of Work, submittal copies for that discipline are not required as noted herein.

For major design submittals, the Design-Build Team may request that a meeting be held with the NCTA, Alternative Delivery Unit, and/or the applicable reviewers of the specific submittal to briefly introduce and explain the submittal. This meeting will in no way affect the review time as stated below if the meeting is held within the first three business days after the submittal, inclusive of the day of the submittal. In the event that the meeting is held after the third day following the submittal, the NCTA reserves the right to begin the review period on the day of the meeting. The meetings shall be requested in writing to the NCDOT Design-Build Project Engineer, with a copy to the State Alternative Delivery Engineer and the NCTA Director of Construction. Although every attempt will be made to accommodate the Design-Build Team's request for a meeting, the NCTA in no way guarantees that all parties of the NCTA or NCDOT will be available for these meetings or that the meeting can occur in a timely manner.

NCTA uses the Internet/Web-based project collaboration software package Constructware, developed by Autodesk, to manage and track projects. As a contract requirement of for NCTA projects, the Design-Build Team will use Constructware to facilitate correspondence, design reviews, transmittals, and RFIs; to store and retain project files, designs, plans, test results and all other project documents; and to communicate collaboratively among project team members. Projects may be designated to use 100% Constructware submittals, or a combination of Constructware submittals and traditional hard copy submittals. (see Design Submittal Procedure Guide for instructions on making submittals in Constructware)

## **Record Drawings / As-Built Plans**

For those projects that the NCTA provides Construction Engineering Inspection the Design-Build Team shall provide Record Drawings. Specifically, upon completion of the project, and in addition to the sets required by the NCTA Project Manager, two sets of Record Drawings, signed and sealed by a Professional Engineer registered in the State of North Carolina, shall be submitted to the NCTA and two copies to the State Alternative Delivery Engineer. The State Alternative Delivery Engineer will retain one set and distribute one set to the appropriate Maintenance Unit.

For those projects that the Design-Build Team provides Construction Engineering Inspection, the Design-Build Team shall provide As-Built Plans in accordance with the Final Contract. Specifically, upon completion of the project, and in addition to the sets required by the NCTA Project Manager, two sets of As-Built Plans, signed and sealed by a Professional Engineer registered in the State of North Carolina, shall be submitted to the NCTA and two sets to the State Alternative Delivery Engineer. The State Alternative Delivery Engineer will retain one set and distribute one set to the appropriate Maintenance Unit.

## **Review Time**

Unless otherwise noted herein or in the Final Contract scopes of work, submittals will be reviewed within 10 working days (15 working days for temporary structures, overhead sign assemblies, MSE walls, FEMA compliance documents and temporary shoring) from the date of the NCTA's receipt. Submittals delivered to the State Alternative Delivery Engineer must be stamped in at the front desk before 2 pm to start the specified review period on that day. If submittals are received after 2 pm, the review period will begin on the following business day. The 10-day review period includes only NCDOT workdays.

NCTA will provide responses to all submittals within Constructware. All comments and mark-ups will be provided electronically to the DBT.

## **Submittal Responses**

The NCTA, or the Alternative Delivery Unit, on behalf of the NCTA, will respond to all submittals. The submittal response will include a standard response form that indicates whether the NCTA has comments or requires a re-submittal on that item.

The comments will be returned to the DBT as noted above. The NCDOT Alternative Delivery Unit will be notified by copy of all submittal response forms returned to the DBT. Copies of the comments, particularly if made directly on the submitted plan sheets, will not be transmitted to the NCTA Project Manager, unless otherwise requested.

The staff of the Alternative Delivery Unit will maintain a database to ensure that all submittals are addressed within the allotted time. A copy of the log of all submittals for a given project is available within Constructware.

### **Submittal Prerequisites**

Unless otherwise noted herein, the NCTA will not accept subsequent submittals until prior submittal reviews have been completed for that item. For example, the 100% submittal for a discipline cannot occur prior to the 25%, 50%, etc. for that same discipline.

Submittals shall be transmitted in a logical order and in accordance with the project CPM or submittal schedule most recently submitted by the DBT. However, if the DBT chooses to submit plans that require prerequisite reviews, the DBT assumes all risks should the prerequisite plan review result in comments that impact the current submittal. Should this occur, NCTA will begin a new review period. Depending on the complexity of the project, certain iterations of these submittals may be waived by the NCTA.

The Design-Build Team may also have the option to divide a project into segments. This approach may prove beneficial to both the DBT and the NCTA on large projects. For example, the project may be broken into a southern, middle, and northern section, resulting in three submittals for each milestone submittal. However, upon completion of the project design, the DBT will be required to provide one set of complete signed and sealed plans that include all design disciplines.

The Design-Build Team shall notify the NCTA and State Alternative Delivery Engineer of any changes to previously reviewed submittals. For example, if the NCTA reviews the horizontal and vertical alignments, the DBT will be required to advise of any subsequent revisions made to those alignments. A re-submittal of that item will generally be necessary. Similarly, any design / construction changes made after submittal of RFC Plans will require submittal for review and acceptance to ensure that dependent plan reviews are based on the most current and accurate information. At a

minimum, this submittal shall follow the standard submittal guidelines, as well as the appropriate discipline prerequisites and review.

Any information included in a submittal for informational purposes shall be noted as such. For example, if the Roadway Plans are included to assist in reviewing the Signing Plans, they shall be noted with “FYI”.

## **SUBMITTALS REQUIRED BY DISCIPLINE**

All design submittals shall be made simultaneously to the State Alternative Delivery Engineer, NCTA Director of Construction, and the NCTA Project Manager.

### **ROADWAY DESIGN**

The submittal of Roadway Plans will generally be comprised of five steps, beginning with design criteria and culminating with RFC Plans. Plans for right-of-way recordation will also be required, if applicable. The various Roadway Plans also need to be submitted with plans for other disciplines as noted throughout this chapter. Any changes to a stage of the Roadway Plans made after that stage’s initial review and comment by the NCTA will require re-submittal to ensure that dependent plan reviews are based on the most current and accurate Roadway Plans.

For guidance in preparing these plan submittals, see the document entitled “Roadway Design Guidelines for Design-Build Projects” located on the NCTA website. All submittals must adhere to the NCDOT Review requirements for Preliminary, Right of Way / 60%, and Final Plans located on the NCTA website.

The Design-Build Team shall develop plans using the current version of Microstation and Geopak software required by the Department and shall be in English units, unless otherwise noted in the Final Contract. The plans shall follow the Department’s CADD standards including, but not limited to, file naming convention, leveling chart, and file folder structure. These standards can be found through a link on the NCDOT website.

The Design-Build Team shall submit electronic files of the Roadway Plans upon request by the NCTA.

#### **Design Criteria and Structure Recommendations**

**Total Number Required:**

**(3 sets)**

- ❑ Alternative Delivery Unit (3 sets)

### **Line and Grade Plans**

At the request of the Design-Build Team, the Department will review Line and Grade Plans. This submittal shall include the Team's horizontal and vertical alignments and shall not replace the Preliminary Roadway Plans submittal. The Design-Build Team may submit Design Criteria and Structure Recommendations concurrent with this submittal. If the Design-Build Team elects to combine these submittals, then the review time for the combination of Line and Grade Plans, Design Criteria, and Structure Recommendations will be 15 days.

#### Prerequisites:

- ❑ Accepted Design Criteria (Provide one set with this submittal) if separate submittal
- ❑ Accepted Structure Recommendations if separate submittal

Total Number Required: (3 – 5 Full-size, 2 Half-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Preconstruction (1 Full-size and 1 Half Size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size with design calculations)
- ❑ Congestion Management Section (1 Half-size w/Capacity Analysis)
- ❑ Railroad Division, if applicable (1 Full-size)
- ❑ FHWA, if applicable (1 Full-size)
- ❑ Roadway Lighting Section, if applicable (Microstation files)

### **Preliminary Roadway Plans**

#### Prerequisites:

- ❑ Accepted Design Criteria (Provide one set with this submittal)
- ❑ Accepted Preliminary Bridge / Culvert Survey Reports (If grade is hydraulically controlled) or letter stating that grade is not hydraulically controlled
- ❑ Accepted Structure Recommendations

Total Number Required: (5 – 7 Full-size, 2 Half-size, 6 – 8 x-sections)

- ❑ NCTA Project Manager (1 Full-size with x-sections)



- Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half Size with x-sections)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size with x-sections & design calcs.)
- ❑ Hydraulics Unit (1 Full-size with x-sections)
- ❑ Utilities Coordination Unit (1 Full-size with x-sections)
- ❑ Congestion Management Section (1 Half-size w/Capacity Analysis)
- ❑ Railroad Division, if applicable (1 Full-size with x-sections)
- ❑ FHWA, if applicable (1 Full-size with x-sections)
- ❑ Roadway Lighting Section, if applicable (Microstation files)

### **Right of Way / 60% Roadway Plans**

The Design-Build Team shall provide either Right of Way or 60% Roadway Plans for review. If the Design-Build Team is acquiring the right of way, this submittal shall be noted as Right of Way Plans, otherwise this submittal shall be referred to as 60% Roadway Plans.

The Design-Build Team shall provide a copy of the Right of Way Plans for right of way recordation in both electronic and hard copy format.

#### **Prerequisites:**

- ❑ Approved Design Exceptions
- ❑ Accepted 100% Hydraulics Design Plans
- ❑ Accepted Preliminary Roadway Plans

**Total Number Required:** (7 – 9 Full-size, 3 Half-size, 10 – 12 x-sections)

- ❑ NCTA Project Manager (2 Full-size with x-sections)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (3 Full-size and 3 Half Size with x-sections)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size with x-sections)
- ❑ Utilities Coordination Unit (1 Full-size with x-sections)
- ❑ Railroad Division, if applicable (1 Full-size with x-sections)
- ❑ FHWA, if applicable (1 Full-size with x-sections)

### **Final Roadway Plans**

This submittal does not require all summary and quantity sheets.

**Total Number Required:** (5 - 6 Full-size with cross-sections)

- ❑ NCTA Project Manager (2 Full-size with x-sections)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (2 Full-size and 2 Half Size with x-sections)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size with cross-sections)
- ❑ FHWA, if applicable (1 Full-size with x-sections)

### **RFC Roadway Plans**

The Design-Build Team shall provide a copy of the RFC Roadway Plans (final plans) in both electronic and hard copy form. All final designs shall be signed and sealed by a Professional Engineer registered in the State of North Carolina.

#### **Prerequisites:**

- ❑ Submittal of Typical Sections for the NCTA to sign and seal the pavement design, if applicable

**Total Number Required:** (6 – 8 Full-size, 4 - 6 Half-size, 10 – 14 x-sections)

- ❑ NCTA Project Manager (2 Full-size with x-sections)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (3 Full-size and 3 Half Size with x-sections)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size & 1 Half-size with x-sections)
- ❑ FHWA, if applicable (1 Full-size with x-sections)
- ❑ Roadway Lighting Section, if applicable (1 Full size with x-sections)
- ❑ Signals Section, if applicable (1 Half-size with x-sections)
- ❑ ITS Engineer, if applicable (1 Half-size with x-sections)

### **Temporary Roadway Alignments**

The Design-Build Team shall submit all temporary roadway alignments for review. The submittal of temporary roadway alignments shall adhere to the Preliminary and Final Plans requirements noted above.

#### **Prerequisites:**

- ❑ Accepted appropriate Traffic Control Phase

## PAVEMENT DESIGN

The Pavement submittals will consist of typical sections, shoulder drains and temporary pavement designs, including but not limited to the evaluation of existing shoulders and roadways regarding their suitability for carrying traffic.

### Typical Sections

This submittal shall include all typical sections, wedging details and pavement schedules required to build the project. Prior to submittal, the Design-Build Team's Roadway Design Engineer of Record shall have signed and sealed the typical sections.

#### Prerequisites:

- ☐ Accepted Final Roadway Plans (Include a full-size set, with cross sections)

Total Number Required: (2 Full-Size)

- ☐ NCTA Director of Construction (1 Full-size)
- ☐ Alternative Delivery Unit (1 Full Size)

### Shoulder Drains

This submittal shall include the shoulder drain locations, designs and outlet locations, including all required details.

#### Prerequisites:

- ☐ Accepted Final Roadway Plans (Include a full-size set, with cross sections)
- ☐ Accepted 100% Hydraulic Design

Total Number Required: (2 Full-Size)

- ☐ NCTA Director of Construction (1 Full-size)
- ☐ Alternative Delivery Unit (1 Full Size)

### Temporary Pavement Design

This submittal shall include all information / calculations required to review the temporary pavement design, including but not limited to the temporary traffic volumes, duration of use, existing pavement structure and geotechnical details.

Prerequisites:

- ❑ Accepted appropriate Traffic Control Plans

Total Number Required:

(2 Full-Size)

- ❑ NCTA Director of Construction
- ❑ Alternative Delivery Unit

(1 Full-size)

(1 Full Size)

## STRUCTURE DESIGN

Plan submittals for bridges will be delineated into two stages, preliminary and final. Culvert and noise wall plans may be submitted in one stage. For retaining wall plan submittals, see "Geotechnical Design" later in this chapter.

### Bridge / Culvert Preliminary General Drawings

Preliminary General Drawings shall contain sufficient details (drawings or narrative) to explain the scope of design and construction intended for the bridge, and shall list all anticipated special provisions and notes describing design data and material properties.

#### Prerequisites:

- ❑ Accepted Preliminary Roadway Plans
- ❑ Accepted Roadway Structure Recommendations
- ❑ Accepted Hydraulic Bridge / Culvert Survey Report
- ❑ Provide two sets of Half-size plans and reports / recommendations of the above to Alternative Delivery Unit concurrently with this bridge submittal

#### Total Number Required:

(2 Full-size, 4 – 6 Half-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size)
- ❑ Structure Design Unit (2 Half-size)
- ❑ Railroad Division, if applicable (1 Half-size)
- ❑ FHWA, if applicable (1 Half-size)
- ❑ Geotechnical Engineering Unit (1 Half-size)
  - For information only

### Bridge Substructure / Superstructure Final Plans

Final Plans are expected to have all plan details and notes completed for final review. The Final Plans may be separated into substructure and superstructure or other submittals as necessary to accommodate construction schedules.

All comments by the NCTA, FHWA, Railroad, or other agency on all submittals shall be addressed in writing and by making appropriate changes to designs or drawings before construction of those elements begins.

Prerequisites:

- ❑ Accepted Bridge Geotechnical Foundation Recommendations
- ❑ Provide two sets of recommendations to Alternative Delivery Unit concurrently with this bridge submittal

Total Number Required:

(4 Full-size, 3 - 5 Half-size)

- ❑ NCTA Project Manager (2 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (2 Full-size)
  - Sent directly by the DBT
- ❑ Railroad Division, if applicable (1 Half-size)
- ❑ FHWA, if applicable (1 Half-size)
- ❑ Alternative Delivery Unit (1 Half-size)
- ❑ Structure Design Unit (2 Half-size)

**Bridge / Culvert RFC Plans**

One complete set of original design files shall be submitted concurrently with the RFC plans submitted to the Alternative Delivery Unit and the NCTA Director of Construction. Structure Project Special Provisions may be found through the NCDOT website. The record plan set, design files, and Project Special Provisions shall bear the seal of a North Carolina registered Professional Engineer.

Total Number Required:

(4 Full-size, 5 – 7 Half-size, 7 – 9 sets of PSPs)

- ❑ NCTA Project Manager (2 Full-size and 2 sets of PSPs)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (2 Full-size and 2 sets of PSPs)
  - Sent directly by the DBT
- ❑ Railroad Division, if applicable (1 Half-size and 1 set of PSPs)
- ❑ FHWA, if applicable (1 Half-size and 1 set of PSPs)
- ❑ Alternative Delivery Unit (1 Half-size and 1 set of PSPs)
- ❑ Structure Design Unit (2 Half-size and 2 sets of PSPs)

- ❑ Materials and Tests Unit (2 Half-size)
  - For Prestressed Concrete Bridges only

### **Working Drawing Submittals**

Working drawing submittals shall be in accordance with the “Submittal of Working Drawings” Project Special Provision available at the following site:

<http://www.ncdot.org/doh/preconstruct/highway/structur/psp/newpsp06/PSP029.doc>

Sufficient data and one set of the applicable RFC plans shall be submitted prior to, or with, the working drawings to facilitate review.

These submittals shall be submitted to the State Alternative Delivery Engineer and shall be covered with a color-coded transmittal form. All other aspects of the aforementioned Project Special Provision apply, including the number of copies and concurrent submittal to the NCTA Project Manager. All working drawing submittals shall include a submittal number with the prefix “WD-“

Responses to working drawing submittals will be routed directly to the NCTA Project Manager, with a copy of the response to the State Alternative Delivery Engineer.



## HYDRAULIC DESIGN

Hydraulic design plans shall not be submitted prior to the NCTA's acceptance of the Preliminary Roadway Plans. Culvert and bridge survey reports are also required unless otherwise noted in the Final Contract that the NCTA will provide them. Any design and / or construction methods that nullify a culvert or bridge survey report provided by the NCTA shall require the Design-Build Team to revise and submit the report as noted below. The NCDOT Hydraulics Unit also reviews key submittals for permit application packages. The Design-Build Team is solely responsible for ensuring that the design plans exactly match those details included in the permit impact sheets.

### Preliminary Bridge / Culvert Survey Reports

Prior to submittal of the Preliminary Roadway Plans, the Design-Build Team shall provide one of the following:

- If the proposed grade is not hydraulically controlled at bridge / culvert location(s), the Design-Build Team shall provide a letter to the NCTA stating such.
- If the proposed grade is hydraulically controlled at bridge / culvert location(s), the Design-Build Team shall provide preliminary reports that are clearly identified as preliminary.

<u>Total Number Required:</u>	(3 Copies)
<input type="checkbox"/> NCTA Director of Construction	(1 Copy)
<input type="checkbox"/> Alternative Delivery Unit	(1 Copy)
<input type="checkbox"/> Hydraulics Unit	(1 Copy)

### Bridge / Culvert Survey Reports

#### Prerequisites:

Accepted Preliminary Roadway Plans and x-sections

<u>Total Number Required:</u>	(4 Copies)
<input type="checkbox"/> Alternative Delivery Unit	(1 Copy)
<input type="checkbox"/> Hydraulics Unit	(1 Copy)
<input type="checkbox"/> NCTA Project Manager	(1 Copy)
• Sent directly by the DBT	
<input type="checkbox"/> NCTA Director of Construction	(1 Copy)
• Sent directly by the DBT	

Upon acceptance from the NCTA, the Design-Build Team shall provide a report signed and sealed by a Professional Engineer registered in the State of North Carolina for each of the Units noted below, for informational purposes only.

- ☐ Alternative Delivery Unit
- ☐ Hydraulics Unit
- ☐ Structure Design Unit
- ☐ Geotechnical Engineering Unit Regional Office
- ☐ Roadside Environmental Unit (If construction phasing is required)
- ☐ NCTA Project Engineer
  - Sent directly by the DBT
- ☐ NCTA Director of Construction
  - Sent directly by the DBT

#### **Concurrence Point 4B Meeting**

This submittal shall include the Title Sheet and all Plan Sheets. The Plan Sheets should incorporate subdued contour lines. If subdued contour lines are not legible, two copies of each plan sheet shall be required, one with contour lines and one without. Unless otherwise stated in the RFP, this submittal shall be submitted a minimum of five weeks prior to the 4B Meeting as applicable for review.

#### **Prerequisites:**

- ☐ Accepted Preliminary Roadway Plans and x-sections
- ☐ One set of Preliminary Roadway Plans to be submitted concurrently with this submittal

**Total Number Required:** (4 Half-size)

- ☐ Alternative Delivery Unit (1 Half-size)
- ☐ Hydraulics Unit (include red-line drawings) (1 Half-size)
- ☐ PDEA (1 Half-size)
- ☐ NCTA Director of Construction (1 Half-size)

Upon acceptance from the NCTA, submit one set of half-size plans for each of the above Units and for each of the following agencies. This submittal shall provide

adequate time for the NCTA to forward the plans to the agencies for their receipt a minimum of two weeks prior to the 4B meeting.

US Army Corps of Engineers

US Fish and Wildlife Service

EPA

NC Wildlife Resources Commission

NC DENR - Division of Water Quality

All Other Agencies and NCDOT Personnel as  
Needed

### **100% Hydraulic Design**

#### **Prerequisites:**

- ❑ Accepted Preliminary Roadway Plans and x-sections

#### **Number Required:**

(4 Full-size)

- ❑ Alternative Delivery Unit (1 Full-size)
- ❑ Hydraulics Unit (include hydraulic calculations and red-line mark ups) (1 Full-size)
- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT

### **4C and / or Permit Application / Modification Review Submittal**

This submittal shall include all necessary documents required for a permit application including, but not necessarily limited to a cover letter, meeting minutes, plans, permit impact sheets, and forms. Unless otherwise stated in the RFP, this package shall be submitted a minimum of five weeks prior to the intended permit application submittal date or 4C meeting, as applicable.

#### **Prerequisites:**

- ❑ Accepted 100% Hydraulic Plans

Number Required: (7 or 8 Half-size)

- ☐ Alternative Delivery Unit (1 Half-size)
- ☐ Hydraulics Unit (1 Half-size)
- ☐ PDEA (2 Half-size)
- ☐ Structure Design Unit (If causeway is required) (1 Half-size)
- ☐ NCTA Project Manager (1 Half-size)
- ☐ NCTA Director of Construction (2 Half-size)

Upon acceptance from the NCTA, submit one set of half-size plans and permit impact sheets for each of the above Units and for each of the following agencies. This submittal shall provide adequate time for the NCTA to forward the plans and permit impact sheets to the agencies for their receipt a minimum of two weeks prior to the 4C meeting.

US Army Corps of Engineers  
US Fish and Wildlife Service  
EPA

NC Wildlife Resources Commission  
NC DENR - Division of Water Quality  
All Other Agencies and NCDOT Personnel as  
Needed

## **GEOTECHNICAL DESIGN**

The Geotechnical submittals will consist of retaining wall plans and design, foundation recommendations, and temporary shoring plans and designs, and other items as required by the RFP.

### **Permanent Retaining Wall Layout**

For each retaining wall, with the exception of standard gravity walls, submit a wall layout and design. The wall layout submittal shall include (1) wall envelope with top and bottom of wall, existing ground and finished grade elevations at incremental stations; (2) wall alignment with stations and offsets; (3) typical sections showing top and bottom of wall, drainage, embedment, slopes, barriers, fences, etc.; and (4) details of conflicts with utilities and drainage structures. This submittal must also include calculations for bearing capacity, global stability and settlement.

#### **Prerequisites:**

- ❑ Accepted Preliminary Roadway Plans and x-sections at wall locations
- ❑ Provide 1 Half-size set of each of the above concurrently with the wall layout

**Total Number Required:** (3 Full-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size)
- ❑ Geotechnical Engineering Unit Regional Office (1 Full-size)

### **Permanent Retaining Wall Design**

If temporary shoring is required to construct a retaining wall, submit the temporary shoring design as part of the wall design submittal.

#### **Prerequisites:**

- ❑ Accepted Retaining Wall Layout
- ❑ Temporary Shoring Design (if required for construction of retaining wall)
- ❑ Provide 1 set of each of the above with each Retaining Wall design

Total Number Required: (5)

- ❑ NCTA Project Manager (1)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1)
- ❑ Geotechnical Engineering Unit Regional Office (1)
- ❑ FHWA, if applicable (1)

### **Foundation Design Recommendation Reports**

A separate Structure Foundation Design Recommendation Report is required for each structure, except permanent retaining walls, and one Roadway Foundation Design Recommendation Report is required for the entire project. All sound barrier foundations shall be addressed in a foundation design report and will be considered one submittal. All Foundation Design Recommendation Reports, plans, Project Special Provisions and calculations shall be sealed by a registered Professional Engineer licensed in the state of North Carolina.

Total Number Required: (6 sets of all reports, PSPs, and calculations)

- ❑ NCTA Project Manager (1 set)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 set)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Geotechnical Engineering Unit Regional Office (2 sets)
- ❑ FHWA, if applicable (1 set)

### **Soil Improvement and Reinforced Fill Designs**

Submit each soil improvement and reinforced fill design in two stages. The first is a conceptual design and the latter is a final design. The conceptual design must be reviewed and accepted prior to the submission of the final design. All designs shall be sealed by a registered Professional Engineer licensed in the state of North Carolina.

Total Number Required:

(5 sets of designs)

- ❑ NCTA Project Manager (1 set)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 set)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Geotechnical Engineering Unit Regional Office (2 sets)
- ❑ FHWA, if applicable (1 set)

## **TRAFFIC CONTROL**

The Traffic Control Plans shall be submitted in three distinct phases, including a staging concept, phase submittals, and RFC plans.

The Design-Build Team shall follow the “Guidelines for Preparation of Traffic Control and Pavement Marking Plans for Design Build Projects”, available through the NCTA website, as a guideline for developing plans.

### **Traffic Control Staging Concept**

#### **Prerequisites:**

- ☐ Accepted Preliminary Roadway Plans and x-sections
- ☐ Accepted 30% Hydraulics Plans
- ☐ Accepted Bridge Preliminary General Drawings (if staging construction)
- ☐ Provide 1 set of the above with each staging concept submittal

#### **Total Number Required:**

(3 Full-size and 4 Half-size)

- ☐ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ☐ Alternative Delivery Unit (1 Full size and 1 Half-size)
- ☐ Signals Section, if applicable (1 Half-size)
- ☐ Work Zone Traffic Control Unit (1 Full Size and 1 Half-size)

### **Traffic Control Phase Submittals**

Phase submittals shall include more detailed information than that required for the staging concept. A separate submittal shall be required for each Traffic Control Phase unless prior approval of another submittal process is obtained from the State Alternate Delivery Engineer.

#### **Prerequisites:**

- ☐ Accepted Culvert and Structure Staging
- ☐ Accepted Temporary Signal Plans
- ☐ Provide 1 Half-size set of Signals Plans, if applicable



Total Number Required: (3 Full-size and 4-6 Half-size)

- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full Size and 2 Half-size)
- ❑ Signals Section, if applicable (1 Half-size)
- ❑ Signing Section, if submittal contains detour signing (1 Half-size)

### **Traffic Control RFC Plans**

The Design-Build Team shall release Traffic Control Plans for construction one phase at time, unless prior approval is obtained from the State Alternate Delivery Engineer.

Total Number Required: (3 Full-size and 4 - 5 Half-size)

- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size and 1 Half-size)
- ❑ Signals Section, if applicable (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

## PAVEMENT MARKINGS

The Design-Build Team shall follow the “Guidelines for Preparation of Traffic Control and Pavement Marking Plans for Design-Build Projects”, available through the NCTA website, as a guideline for developing plans

### Preliminary Pavement Marking Plans

#### Prerequisites:

- ❑ Accepted Right of Way / 60% Roadway Plans
- ❑ Provide 1 Half-size set of Right of Way / 60% Roadway Plans with this submittal

Total Number Required: (3 Full-size and 5 - 6 Half-size)

- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size and 2 Half-size)
- ❑ Signals Section, if applicable (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

### Final Pavement Marking Plans

#### Prerequisites:

- ❑ Final Signals Plans
- ❑ Provide 1 Half-size set of Final Signal Plans with this submittal

Total Number Required: (3 Full-size and 5 - 6 Half-size)

- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Full-size and 2 Half-size)
- ❑ Signals Section, if applicable (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

### **RFC Pavement Marking Plans**

After the reviewed Final Pavement Marking Plan is returned, if any comments require changes to the plans, a sealed set of revised plans will be required before final traffic control devices, final pavement markings and final pavement markers can be installed. Otherwise, the Final Pavement Marking Plans can be signed and sealed by a Professional Engineer registered in the State of North Carolina and re-distributed as RFC Plans as follows:

<u>Total Number Required:</u>	(3 Full-size and 5 - 6 Half-size)
<input type="checkbox"/> NCTA Project Manager	(1 Full-size and 1 Half-size)
• Sent directly by the DBT	
<input type="checkbox"/> NCTA Director of Construction	(1 Full-size and 1 Half-size)
• Sent directly by the DBT	
<input type="checkbox"/> Alternative Delivery Unit	(1 Full-size and 2 Half-size)
<input type="checkbox"/> Signals Section, if applicable	(1 Half-size)
<input type="checkbox"/> Division Traffic Engineer	(1 Half-size)

## **TRAFFIC SIGNAL & INTELLIGENT TRANSPORTATION SYSTEMS**

The Traffic Signal & Intelligent Transportation System Plans shall be divided into Preliminary, Final and RFC plans. The Traffic Signal & Intelligent Transportation System Plans shall follow the “Guidelines for Preparation of Traffic Signal & Intelligent Transportation System Plans on Design-Build Projects” available on the NCTA website.

For all plan submittals, the Design-Build Team shall provide the NCTA a copy of all supporting documentation, computer files, and any other pertinent information as required for a complete and accurate review by the Department. Supporting documentation may include, but not be limited to the information shown in the Guidelines mentioned above.

The Design-Build Team shall develop plans using the current version of Microstation software required by the NCDOT and shall be in English units, unless otherwise noted in the Final Contract. The plans shall follow the NCDOT’s CADD standards including, but not limited to, file naming convention, leveling chart, and file folder structure. These standards can be found through a link on the NCDOT website.

The Design-Build Team shall submit electronic files of the Traffic Signal & Intelligent Transportation System Plans once they are released for construction.

### **Traffic Signal and ITS Plans (Preliminary, Final, & RFC)**

Please refer to the “Guidelines for Preparation of Traffic Signal & Intelligent Transportation System Plans on Design-Build Projects” for the contents of traffic signal plans.

The ITS Plans will include the following information with all supporting documentation and information in addition the material described in the “Guidelines for Preparation of Traffic Signal & Intelligent Transportation System Plans on Design-Build Projects”:

- Typical details,
- Plan specific details,
- Communications cable routing,
- Splicing details
- Cable attachment locations (as applicable),
- Block diagrams,
- Structural details,

- Mounting details, and
- Equipment rack layouts.

Total Number Required: (4 Full-size and 8 Half-size)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size)
- ❑ Signals and/or ITS Section (as applicable) (2 Full-size and 2 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)
- ❑ Regional ITS Engineer (as applicable) (1 Half-size)
- ❑ Traffic Systems Operation (as applicable) (1 Half-size)

#### **Utility Make-Ready Plans (Preliminary, Final, & RFC)**

Total Number Required: (4 Full-size and 8 Half-size)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size)
- ❑ Signals or ITS Section (as applicable) (2 Full-size and 2 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)
- ❑ Regional ITS Engineer (as applicable) (1 Half-size)
- ❑ Traffic Systems Operation (as applicable) (1 Half-size)

#### **Electrical and Programming Detail Plans (Final & RFC)**

Final Electrical and Programming Detail Plans must be sealed by a Professional Engineer registered in the State of North Carolina.

Prerequisites:

- ❑ Accepted Preliminary Traffic Signal Plans

Total Number Required: (4 Full-size and 6 Half-size)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size)
- ❑ Signals or ITS Section (as applicable) (2 Full-size and 2 Half-size)
- ❑ Division Traffic Engineer or Regional ITS Engineer (as applicable) (1 Half-size)

**Communications Cable & Conduit Routing Plans (Preliminary, Final, & RFC)**

Communication Cable and Conduit Routing Plans must be sealed by a Professional Engineer registered in the State of North Carolina.

**Prerequisites:**

- ❑ Accepted Final Utility Make-Ready Plans

Total Number Required: (4 Full-size and 8 Half-size)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size)
- ❑ Signals and/or ITS Section (as applicable) (2 Full-size and 2 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)
- ❑ Regional ITS Engineer (as applicable) (1 Half-size)
- ❑ Traffic Systems Operation (as applicable) (1 Half-size)

**Project Special Provisions (Final and RFC)**

Project Special Provisions will cover all items of work, material, equipment, and methods of construction for the installation of a complete traffic signal system that are not otherwise covered in the Standard Specifications for Roads and Structures, Dated July 2006. All Project Special Provisions must be sealed by a Professional Engineer registered in the State of North Carolina.

Prerequisites:

- ❑ Preliminary Traffic Signal and ITS Plans
- ❑ Preliminary Communications Cable & Conduit Routing Plans

Total Number Required: (10 sets)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (2 sets)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (2 sets)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Signals and/or ITS Section (as applicable) (2 sets)
- ❑ Division Traffic Engineer (1 set)
- ❑ Regional ITS Engineer (as applicable) (1 set)
- ❑ Traffic Systems Operation (as applicable) (1 set)

**Product Catalog Cut Sheets:**

Product Catalog Cut Sheets shall be submitted and shall include the manufacturer's make and model number for each piece of equipment, and the quantity of items to be used. The Engineer is not required to seal product catalog cut sheets.

Provide written certification to NCTA that all ITS Design-Build Team-furnished material is in accordance with the contract. When requested by NCTA, provide additional certifications from independent testing laboratories and sufficient data to verify that the item meets applicable Specifications. Ensure additional certification states the testing laboratory is independent of the material manufacturer and neither the laboratory nor the manufacturer has a vested interest in the other.

Identify all proprietary parts in ITS Design-Build Team-furnished material. NCTA reserves the right to reject material that uses proprietary components not commercially available through electronic or electrical supply houses.

For ITS Design-Build Team-furnished material listed on the QPL, furnish submittals in the format defined by the QPL.

For ITS Design-Build Team-furnished material not on the QPL, furnish in Constructware the equipment list including the catalog cuts. Identify proposed material

on catalog cuts by a reproducible means (highlighter pen does not transfer to copies). Ensure material lists contain material description, brand name, manufacturer's address and telephone number, stock number, size, identifying trademark or symbol, and other appropriate ratings.

**Prerequisites:**

- ❑ RFC Traffic Signal and ITS Plans
- ❑ RFC Electrical & Programming Detail Plans
- ❑ RFC Communications Cable & Conduit Routing Plans
- ❑ RFC Project Special Provisions

**Total Number Required:** (8 sets)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (2 sets)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (2 sets)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Signals or ITS Section (as applicable) (3 sets)

**Test Results:**

Refer to product specific requirements in the scope of work of the project.

**Prerequisites:** Completed tests.

**Total Number Required:** (5 sets)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (1 set)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 set)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Signals or ITS Section (as applicable) (1 set)
- ❑ Division Traffic Engineer or Regional ITS Engineer (as applicable) (1 set)

**Plan of Record Documentation:**



Before final acceptance, furnish plan of record documentation of all field work. Plan of record documentation will be subject to approval before final acceptance. Store documentation for ITS installations in a manila envelope placed in a weatherproof holder mounted within each cabinet or housing for easy access. Provide the Engineer with two copies of the plan of record documentation for all cable routing plans and splice diagrams.

Provide real world coordinates for all field devices installed under this project. (including but not limited to DMS signs, road weather information station [RWIS], microwave vehicle detection system [MVDS], closed circuit television cameras [CCTV], and oversized junction boxes) installed and/or modified under this project. Provide the coordinates in feet units using the North Carolina State Plane coordinate system (1983 North American Datum also known as NAD '83). Furnish coordinates that do not deviate more than 1.7 feet in the horizontal plane and 3.3 feet in the vertical plane. Global positioning system (GPS) equipment able to obtain the coordinate data within these tolerances may be used. Submit cut sheets on the GPS unit proposed to collect the data for approval by the Engineer. For equipment cabinets, obtain and provide the location of the cabinet.

Obtain the location of the pole or structure to which the ITS device is attached. In the event the ITS device is attached to a structure other than a pole (such as a noise wall, water tower or a building), obtain the ITS device position as directed by the Engineer. For all other devices, unless otherwise directed by the Engineer, obtain the location of the device controller/communications cabinet.

Provide a digital copy of all information regarding the device (including but not limited to, manufacturer, model number, and NCTA inventory number) in the Microsoft spreadsheet provided by the Authority. See below for an example.

<b>NCTA Inv #</b>	<b>Name</b>	<b>Location</b>	<b>Latitude</b>	<b>Longi- tude</b>	<b>Manu- facturer</b>	<b>Model #</b>	<b>Comm Media</b>	<b>Destina- tion</b>
01-7009	DMS # 1	Triangle Parkway	-78.8123	35.8625	Acme ITS	123-456	48 SMFO	TMC
01-7001	MVDS # 20	Western Wake Freeway	-78.7631	35.8523	Acme ITS	123-456	48 SMFO	TMC
01-7003	CCTV # 3	Triangle Parkway	-77.952	35.2456	Acme ITS	123-456	48 SMFO	TMC
01-7004	RWIS # 1	Western Wake Freeway	-78.7631	35.8523	Acme ITS	123-456	48 SMFO	TMC

Prerequisites:

- ❑ Completion of all construction and all punch list items.

Total Number Required: (6 sets)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (2 sets)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 set)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Signals or ITS Section (as applicable) (1 set)
- ❑ Division Traffic Engineer or Regional ITS Engineer (as applicable) (1 set)

Provide operations and maintenance manual, electrical schematic diagram, and cabinet wiring diagram for each control equipment cabinet and piece of equipment in cabinet. Place a marked-up "redline" copy of the cabinet wiring diagram inside the cabinet immediately upon installation of the cabinet and provide an electronic copy upon final acceptance. Place manuals and prints in weatherproof holder. For wiring diagrams and electrical schematic diagrams not bound into printed manuals, provide copies at least 22" x 34". Provide detailed wiring diagrams that include interconnection of equipment with pin-out configurations, pin functions, and cable parts numbers.

For communications systems, camera systems, intelligent transportation systems, and other computerized systems, provide system connection diagrams showing system interconnection cables and associated terminations for both copper and fiber-optic cables.

Except for standard bound manuals, bind all 8 1/2" x 11" documentation, including 11" x 17" drawings folded to 8 1/2" x 11", in logical groupings in either 3-ring or plastic slide-ring loose-leaf binders. Permanently label each grouping of documentation.

Prerequisites:

- ❑ Completion of all construction and all punch list items.

Total Number Required: (6 sets)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (2 sets)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 set)

- Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Signals or ITS Section (as applicable) (1 set)
- ❑ Division Traffic Engineer or Regional ITS Engineer (as applicable) (1 set)

Provide the NCTA with a license to duplicate all programmable devices in equipment for maintenance and software upgrades. Provide binary or hexadecimal format files for each device that may be programmed by the NCTA. Ensure files are provided on PC compatible compact disks or other approved media.

Ensure firmware performance upgrades that occur during the contract period up through final acceptance of the project are furnished to the NCTA at no additional cost.

Make firmware upgrades that are developed to correct operating characteristics available to the NCTA at no additional cost until the warranty period expires.

Prerequisites:

- ❑ Completion of all construction and all punch list items.

Total Number Required: (5 sets)

- ❑ NCTA via Constructware
- ❑ NCTA Project Manager (1 set)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 set)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 set)
- ❑ Signals or ITS Section (as applicable) (1 set)
- ❑ Division Traffic Engineer or Regional ITS Engineer (as applicable) (1 set)

## **SIGNING**

Signing submittals shall generally be made in three phases. Prior to the submittal of the 50% plans, the Design-Build Team shall coordinate with the NCTA and Alternative Delivery Unit. The Signing Plans shall follow the "Signing Design Guidelines for Design-Build Projects" located on the NCTA website. Signing submittals shall be reviewed by at the following milestones:

### **25% Preliminary Signing Plans**

The signing plan sheets and plan view rollout of the entire project shall include all existing, proposed and future signs (including messages), as well as all necessary sign relocations.

#### **Prerequisites:**

- ❑ Accepted Preliminary Roadway Plans and x-sections
- ❑ Provide one set of half-size Preliminary Roadway Plans to Alternative Delivery Unit concurrently with this signing submittal

**Total Number Required:** (2 Full-size, 5 - 7 Half-size, and 1 Half-size roll-out)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size Rollout)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (2 Half-size and 1 Half-size rollout)
- ❑ FHWA, if applicable (1 Half-size)
- ❑ Signing Section (1 Half-size)
- ❑ Signals Section, if applicable (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

### **50% Initial Signing Plans**

This submittal shall include the revised signing plan view sheets with all signs located by station reference, sign designs, completed Type E and F sign sheets, ground-mounted sign support chart with support designs and design calculation information (S-Dimension Worksheets), and overhead structure line drawing(s), completed in the format of the final product.

Prerequisites:

- ❑ Meeting with NCTA, Alternative Delivery Unit, and Signing Section to discuss the Preliminary Signing Plans
- ❑ Accepted Preliminary Roadway Plans and x-sections
- ❑ Provide one set of half-size Preliminary Roadway Plans to Alternative Delivery Unit concurrently with this signing submittal

Total Number Required: (2 Full-size, 3 - 4 Half-size, and 2 Half-size roll-out)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size rollout)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size and 1 Half-size rollout)
- ❑ FHWA, if applicable (1 Half-size)
- ❑ Signing Section (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

**100% Final Signing Plans**

This submittal shall include structure line drawings, and overhead sign lighting design sheets completed in the format of the final product, and all corrected signing sheets, sign designs of accepted Type A, B and Overlay signs on plan sheets, and supporting documentation required in the 50% submittal. If applicable, this submittal shall include an electronic version of the overhead sign lighting design. The NCTA and Alternative Delivery Unit shall be capable of reviewing the lighting design using the software provided as outlined in the Standard Lighting Design Section of the Signing Design Guidelines for Design-Build Projects. Location of signalized intersections must also be provided to ensure the proper signing at intersections. This submittal shall also include the General Notes sheet with list of applicable Roadway Standard Drawings, a draft of Project Special Provisions, and all corrected signing sheets and supporting documentation required by the 90% submittal review. A 4½" x 4½" area for full size sheets, directly below the project information block in the upper right corner of all sheets, shall be left blank and unobstructed.

Prerequisites:

- ❑ Accepted Right of Way / 60% Roadway Plans
- ❑ Accepted Final Pavement Marking Plans
- ❑ Accepted Traffic Control Staging Concept
- ❑ Provide one set of half-size plans of each of the above to Project Services Unit concurrently with this signing submittal

Total Number Required: (2 Full-size, 3 - 4 Half-size, and 2 Half-size roll-out)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size rollout)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size and 1 Half-size rollout)
- ❑ FHWA, if applicable (1 Half-size)
- ❑ Signing Section (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

**RFC Signing Plans**

This set of plans shall be clearly marked as RFC. All copies shall be sealed by a Professional Engineer registered in the State of North Carolina. This submittal shall include (1) original set of Project Special Provisions sealed by a Professional Engineer registered in the State of North Carolina (see the Project Special Provision section of the Signing Design Guidelines for Design-Build Projects); (2) design files on CD that have name of the Professional Engineer, registration number, and seal date inserted where seal, signature, and date are located on original plans; and (3) all other supporting documentation.

Prerequisites:

- ❑ Field verification of "S" Dimensions for ground mounted and overhead sign assemblies

Total Number Required: (2 Full-size, 3 - 4 Half-size, and 2 Half-size roll-out)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT

- ❑ NCTA Director of Construction (1 Full-size and 1 Half-size rollout)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (1 Half-size and 1 Half-size rollout)
- ❑ FHWA, if applicable (1 Half-size)
- ❑ Signing Section (1 Half-size)
- ❑ Division Traffic Engineer (1 Half-size)

### **Project Special Provisions**

The Design-Build Team shall prepare complete Project Special Provisions for review at both the 100% and RFC plan submittal. A Professional Engineer registered in the State of North Carolina shall seal the final submittal of these Project Special Provisions. A copy of the sealed Project Special Provisions shall be submitted in the manner and quantity designated above for the RFC Signing Plans. The Project Special Provisions shall also be submitted electronically to the NCTA and the Alternative Delivery Unit.

### **Overhead Sign Structures and Luminaire Retrieval System Lighting Design Shop Drawings**

The Design-Build Team shall prepare shop drawings and computations for the design of all overhead sign structures and luminaire retrieval systems.

#### **Prerequisites:**

- ❑ Accepted RFC Signing Plans
- ❑ Field verification of “S” Dimensions for ground mounted and overhead sign assemblies
- ❑ Provide one set of half-size accepted RFC Signing Plans that include field verification of “S” Dimensions for all overhead sign assemblies to Structure Design Unit

#### **Total Number Required:** (13 Half-size)

- ❑ Structure Design Unit Shop Drawings (13 Half-size)  
Design Computations (1 copy)
- ❑ Alternative Delivery Unit (1 Half-size)

- ❑ NCTA Project Manager (1 Half-Size)
- ❑ NCTA Director of Construction (1 Half-size)

### **Sign Lighting Catalog Cuts**

For all overhead sign structures that are lighted, the Design-Build Team shall provide sign lighting catalog cut transmittals that are generated using the NCDOT Signing Section's online qualified products list. The online qualified products list is located at:

<http://www.ncdot.org/doh/preconstruct/traffic/congestion/SIGN/qpl/qpl.html>

If a product complies with the requirements of the NCDOT Standard Specifications for Roads and Structures and is not contained in the online Qualified Products List, the Design-Build Team shall adhere to the submittal process guidelines located online at:

[http://www.ncdot.org/doh/preconstruct/traffic/congestion/SIGN/qpl/equipment\\_submittal.html](http://www.ncdot.org/doh/preconstruct/traffic/congestion/SIGN/qpl/equipment_submittal.html)



## EROSION CONTROL DESIGN

All Erosion and Sedimentation Control Plans must be reviewed and accepted by the NCTA for each distinct project section before **any** land disturbing activities, including clearing and grubbing, can commence on that project section. The RFC Final Grade Erosion Control Plans may only be deemed final after the roadway drainage design has been finalized and accepted by the NCTA. Specifically, acceptance of all Erosion Control submittals, prior to and including the RFC Final Grade Erosion Control Plans, shall be contingent on acceptance of the roadway drainage design. Design modifications developed after acceptance of the RFC Final Grade Erosion Control Plans shall require the Design-Build Team to submit Intermediate Erosion Control Plans for review and acceptance as noted below. Each plan submittal must include all pertinent design information required for review, such as design calculations, drainage areas, etc.

The NCTA will provide a sample set of Erosion and Sedimentation Control plans and MicroStation Erosion Control workspace to the Design-Build Team upon request. The Design-Build Team shall coordinate a pre-design meeting between the NCDOT REU Soil and Water Engineering Section, the NCTA, the Design-Build Team and other pertinent personnel before beginning the erosion control design. The NCTA shall only review Erosion and Sediment Control Plans after the aforementioned pre-design meeting. Release for Construction (RFC) Final Grade Erosion Control Plans shall be accepted by the NCTA and submitted to all personnel listed below before **any** land disturbing activities, including clearing and grubbing, shall commence.

### 75% Clearing & Grubbing Review Plans

#### Prerequisites:

- ❑ Accepted Roadway Line and Grade or Preliminary Roadway Plans and x-sections
- ❑ Pre-design meeting with the NCDOT REU Soil and Water Engineering Section, the NCTA, the Design-Build Team and any other pertinent personnel
- ❑ Provide one set of half-size Roadway Plans, that delineate the proposed slope / stake lines, and x-sections to both the NCTA and the Alternative Delivery Unit concurrently with this submittal

Total Number Required: (2 Full-size and 4 Half-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (4 Half-size)

### **100% Clearing & Grubbing Review Plans**

Prerequisites:

- ❑ Provide one set of half-size Roadway Plans, that delineate the proposed slope / stake lines, and x-sections to both the NCTA and the Alternative Delivery Unit concurrently with this submittal

Total Number Required: (2 Full-size and 4 Half-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (4 Half-size)

### **RFC Clearing & Grubbing Plans**

Prerequisites:

- ❑ Provide one set of half-size Roadway Plans, that delineate the proposed slope / stake lines and drainage, as well as x-sections to both the NCTA and the Alternative Delivery Unit concurrently with this submittal

Total Number Required: (3 Full-size and 5 Half-size)

- ❑ NCTA Project Manager (2 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (4 Half-size)

### **75% Final Grade Erosion Control Plans**

#### **Prerequisites:**

- ❑ Provide one set of half-size Roadway Plans, that delineate the proposed slope / stake lines and drainage, as well as x-sections to both the NCTA and the Alternative Delivery Unit concurrently with this submittal

#### **Total Number Required:**

(2 Full-size and 4 Half-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (4 Half-size)

### **100% Final Grade Erosion Control Plans**

#### **Prerequisites:**

- ❑ Accepted Final Roadway Plans and x-sections when the Design-Build Team is acquiring the permit
- ❑ Accepted 100% Hydraulic Plans when the Design-Build Team is acquiring the permit
- ❑ Provide one set of half-size Roadway Plans, that delineate the proposed slope / stake lines and drainage, as well as x-sections to both the NCTA and the Alternative Delivery Unit concurrently with this submittal

#### **Total Number Required:**

(2 Full-size and 4 Half-size)

- ❑ NCTA Project Manager (1 Full-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (4 Half-size)

### **RFC Final Grade Erosion Control Plans**

This submittal shall include seven sets of Project Special Provisions. Erosion Control Special Provisions are available through the NCDOT website.

**Total Number Required:** (4 Full-size and 6 Half-size)

- ☐ NCTA Project Manager (3 Full-size and 3 Half-size)
  - Sent directly by the DBT
- ☐ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ☐ Alternative Delivery Unit (4 Half-size)

### **Intermediate Plans (if required)**

This submittal shall be required if design modifications and / or site conditions require additional erosion control design or design revisions to the RFC Clearing and Grubbing and / or the RFC Final Grade Erosion Control Plans. This submittal shall also be required to review all basins requiring individual calculations. The NCTA shall review and accept Intermediate Plans prior to construction of any aspect impacted by the revised erosion control design.

#### **Prerequisites:**

- ☐ Accepted Roadway and / or Hydraulic Plans of the design modifications
- ☐ Provide one set of half-size Roadway Plans, that delineate the proposed slope / stake lines and drainage, as well as x-sections to both the NCTA and the Alternative Delivery Unit concurrently with this submittal
- ☐ Provide one set of basin calculations to both the NCTA and the Alternative Delivery Unit concurrently with this submittal

**Total Number Required:** (4 Full-size and 6 Half-size)

- ☐ NCTA Project Manager (3 Full-size and 3 Half-size)
  - Sent directly by the DBT
- ☐ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ☐ Alternative Delivery Unit (4 Half-size)

## LIGHTING

Submit one set of electronic and hard copy Preliminary Roadway Plans and RFC Roadway Plans to the NCTA and the Alternative Delivery Unit to enable the light standard locations and details to be reviewed.

Submit pole and foundation designs and details directly to the NCTA and the Alternative Delivery Unit

### Prerequisites:

- ❑ Accepted Roadway RFC Plans

### Total Number Required:

(3 Full-size and 5 Half-size)

- ❑ NCTA Project Manager (2 Full-size and 2 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (1 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (2 Half-size)
- ❑ FHWA, if applicable (1 Half-size)

## **ORT AND RELATED FACILITIES – ARCHITECTURAL AND STRUCTURAL**

The Architectural Plan Submittal will consist of design calculations and plans for the proposed ORT Facility Buildings. All designs, plans and calculations shall be signed and sealed by a Professional Engineer registered in the State of North Carolina. The minimum drawing scale shall be 1"=16', but shall be adequate to clearly present the design intent. Each of the submittals listed below shall have the following prerequisites and distribution:

### Prerequisites:

- ❑ Accepted Roadway RFC Plans

Total Number Required: (6 Full-size and 5 Half-size)

- ❑ NCTA Project Manager (2 Full-size and 2 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (4 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (2 Half-size)
- ❑ FHWA, if applicable (1 Half-size)

### **ORT Facility Buildings (Structure) / 25% Plans**

This submittal shall contain, at a minimum:

1. Building plans including foundation with concrete sidewalk and maintenance pad, elevation, plan view and roof line view for each type of proposed ORT facility building.
2. Structural design criteria.
3. A construction plan for each type of ORT facility including dimensions and preliminary sizes of the building components.
4. General notes outlining all code required loads including dead, live, wind, seismic, and other applicable loads.

### **ORT Facility Buildings (Structure) / 75% Plans**

In addition to the above, this submittal shall contain, at a minimum:

1. Design criteria and general notes sheets which include finalized design loads.
2. Typical structural details sheet.
3. Construction plans for each ORT facility building including component sizes and other information sufficient for construction.
4. Connections and bracing detail sheets.
5. Materials list.

### **ORT Facility Buildings (Structure) / 100% Plans**

In addition to the above, the Design Build-Team shall submit all the final detailed construction drawings and all associated details, including aesthetic treatments and color schemes. All previous NCTA comments shall be addressed.

## **ORT AND RELATED FACILITIES –**

### **MECHANICAL, ELECTRICAL, PLUMBING AND MONITORING SYSTEM**

This submittal shall include Structural, Electrical, HVAC, and Mechanical/Plumbing plans. Provide design calculations including lighting, HVAC and electrical for all components. All designs, plans and calculations shall be signed and sealed by a Professional Engineer registered in the State of North Carolina.

Each of the submittals listed below shall have the following prerequisites and distribution:

#### Prerequisites:

- ❑ Accepted Roadway RFC Plans

Total Number Required: (6 Full-size and 5 Half-size)

- ❑ NCTA Project Manager (2 Full-size and 2 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (4 Full-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (2 Half-size)
- ❑ FHWA, if applicable (1 Half-size)

#### **Mechanical, Electrical, Plumbing and Monitoring Systems / 25% Plans**

This submittal shall contain, at a minimum:

1. Code Review – Submit a complete Code Review indicating how each code requirement is to be met.
2. Life-cycle Mechanical Analysis – Provide a 10 year life-cycle costs analysis comparing possible mechanical systems using electric, natural gas and propane alternatives for final selection of HVAC System.
3. Utilities – Provide written report regarding the availability of electrical, water and sewer utilities for each proposed site, as applicable.
4. Monitoring System design schematic including details for operation of mechanical systems (i.e. HVAC, alarm, electrical).



### **Mechanical, Electrical, Plumbing and Monitoring Systems / 75% Plans**

In addition to the above, submit the following items. These drawings shall include as a minimum, but not limited to:

1. HVAC equipment plans and sections, including ductwork, louvers and exterior mounted equipment locations.
2. Electrical power, lighting, emergency, and communications systems.
3. Plumbing plans.
4. Standby generator and propane storage tank locations.
5. Monitoring system configuration, controllers, and devices utilized for connection to mechanical systems.
6. Monitoring system communication details including router hardware, and schedule and alarm programs.

Calculations & Equipment Cuts – the Design-Build Team shall submit mechanical and electrical calculations and shall include as a minimum, but not be limited to, the following information:

1. Proposed mechanical, electrical and plumbing fixture and equipment cuts.
2. HVAC load calculations based on the building envelope.
3. Lighting point-by-point calculations for exterior and interior lighting.
4. Standby generator load calculations.
5. Electrical service sizing calculations

### **Mechanical, Electrical, Plumbing and Monitoring Systems / 100% Plans**

In addition to the above, the Design Build-Team shall submit all the final detailed construction drawings and all associated details. All previous NCTA comments shall be addressed. In addition to the above, submit the following items

1. Graphical User Interface (GUI) software application details
2. Listing of special tools and testing equipment required for operation, installation, and maintenance of the equipment.
3. Code compliance shall be provided by submission of final code documentation.
4. Final calculations and equipment cuts.

## RAILROAD INSURANCE

Prior to commencing any activities within a railroad right of way, insurance approval shall be obtained, per activity, from the appropriate railroad(s). The Design-Build Team shall concurrently submit two copies of the insurance documents, which contain all the railroad requirements, to the NCTA and the Alternative Delivery Unit. The NCTA may forward the insurance documents to the NCDOT Rail Division for coordination with the appropriate railroad(s).

## FINAL SUBMITTAL

Upon completion of the project, the Design-Build Team shall provide both electronic and hard copies of the entire project in accordance with the requirements of the Final Contract. The hard copies shall adhere to the NCDOT Design Manual's plan preparation format.

### Total Number Required:

(5 Full-size and 5 - 6 Half-size)

- ❑ NCTA Project Manager (1 Full-size and 1 Half-size)
  - Sent directly by the DBT
- ❑ NCTA Director of Construction (2 Full-size and 2 Half-size)
  - Sent directly by the DBT
- ❑ Alternative Delivery Unit (2 Full-size and 2 Half-size)
- ❑ FHWA, if applicable (1 Half-size)